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SHORT REPORT

Renal Fanconi syndrome with ultrastructural defects in lysinuric protein intolerance

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Summary Renal Fanconi syndrome developed rapidly in a 3-year-old Moroccan girl with established lysinuric protein intolerance. She was hospitalized because of lowered consciousness, uncoordinated movements and hepatosplenomegaly after a febrile period. Laboratory investigations revealed plasma ammonia 270 μmol/L (normal <70 μmol/L), ferritin 159 μmol/L (normal 2–59 μmol/L), LDH 1180 U/L (normal 26–534 U/L). LPI was diagnosed based on the findings of reduced plasma ornithine, arginine and lysine, and an increased level of glutamine. Urinary orotic acid (645 μmol/mmol creatinine; normal <3.6) was strongly increased. A defect in the SLC7A7 amino acid transporter was established (homozygous c.726G>A mutation). Detailed renal function tests including an acid challenge test, bicarbonate loading, and tubular maximal reabsorption of glucose showed complex tubular dysfunction. No evidence of respiratory chain defects was found in muscle or kidney tissue. No morphological abnormalities were demonstrated in the mitochondria. Ultrastructural analysis of proximal tubular cells showed vacuolization and sloughing of the apical brush border (Fig. 1). Renal involvement in LPI has only been described in a few reports; however, no detailed studies of the renal acidification mechanism were performed. Our patient had evidence of a full-blown Fanconi syndrome. Surprisingly, a metabolic acidosis was found with a moderately increased serum anion gap combined with repeatedly normal plasma organic acid values. This finding is in contrast with the diagnosis of renal tubular acidosis. Patients with hyperlysinaemia have a similar heavy load on the renal tubules; they never develop a renal Fanconi syndrome. Therefore, we consider the intratubular accumulation of lysine an unlikely candidate for the development of the renal Fanconi syndrome.

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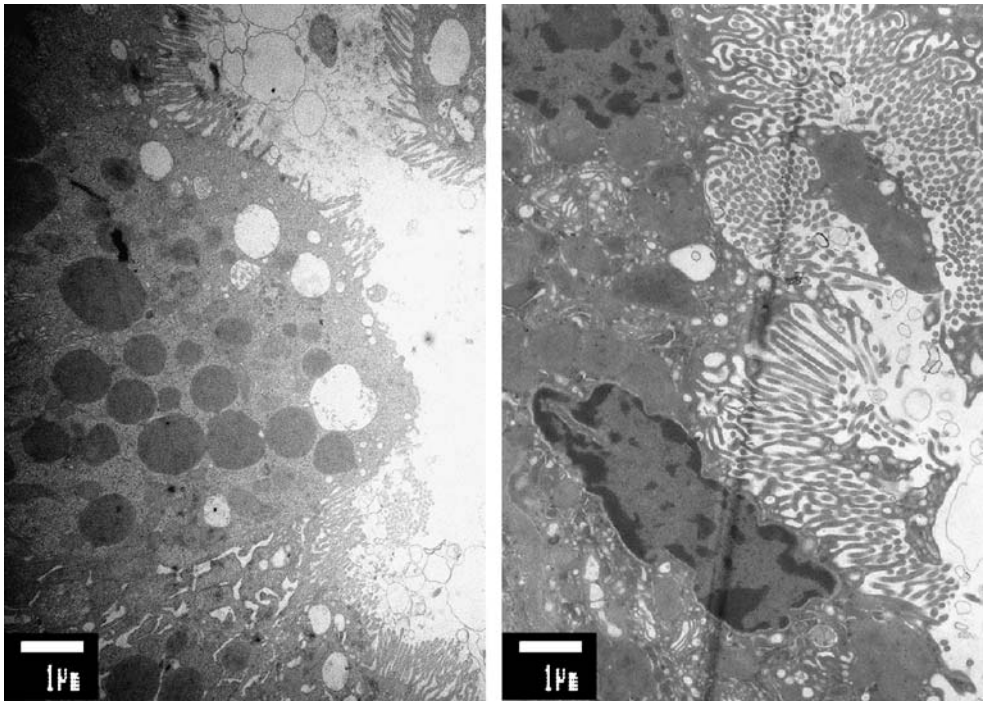

Fig. 1 Left panel shows irregular and partially absent brush border in the patient with LPI. The panel on the right shows the regular brush border architecture in a patient of the same age (biopsy taken in remission phase of idiopathic nephritic syndrome). Note also that in this normal specimen the villi are longer than in the patient with LPI